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ABSTRACT

This is one of a series of units for environmental education developed by the Highline Public Schools. The unit is designed for use by junior high school social studies students. Emphasis of the unit is on planning and conducting an environmental assessment of your local community. The unit contains ten lessons as well as supplementary printed materials. The materials were tried and evaluated; evaluation data may be obtained from the Highline Public Schools. (RH)

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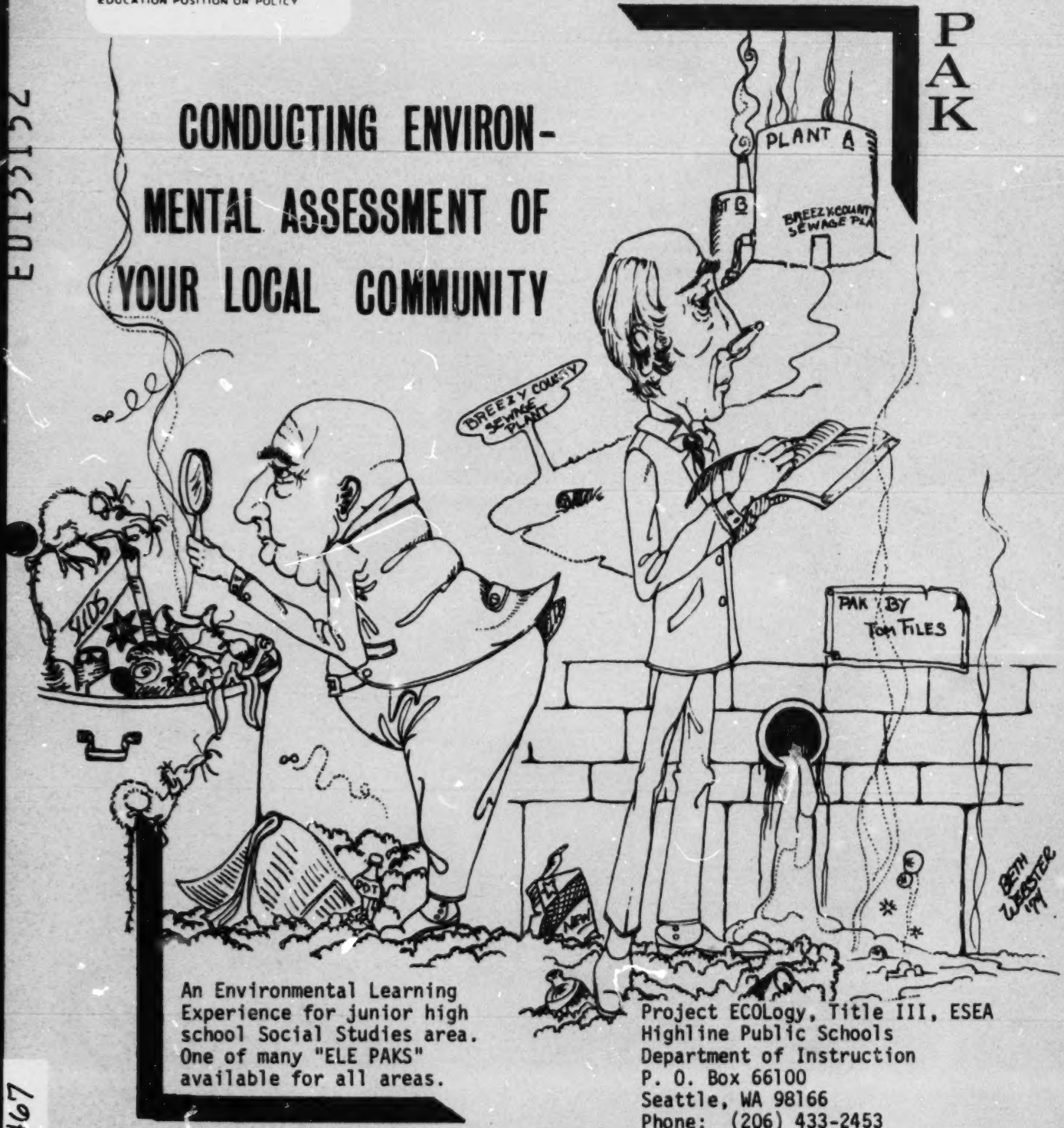
ED135152

FILES PAK

CONDUCTING ENVIRONMENTAL ASSESSMENT OF YOUR LOCAL COMMUNITY



An Environmental Learning Experience for junior high school Social Studies area. One of many "ELE PAKS" available for all areas.

Project ECOLogy, Title III, ESEA
Highline Public Schools
Department of Instruction
P. O. Box 66100
Seattle, WA 98166
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SE 021 467

NATURE KNOWS BEST

PROJECT ECOLOGY TITLE III

The Kids Who Participated in the Pilot Evaluation Program

Jarry Carlile	Elaine Hansen	Judy Griffeth
Glen Christen	Teresa LaRonde	Kelly Hauger
Art Christopherson	Cheryl Marquardt	Sherri Henoult
Bill Coombs	Vickie Martinez	Monica Hubbard
Val Farmer	Rose Misztont	Jeff Weiker
Mike Herman	Erin Morgan	Jeff Christianson
Jim Lockrem	Bev Osborne	Gary Gribble
Cliff Maslow	Carol Thomas	Terri Kelly
Tom Murphy	Deanna Roach	Tami King
Tom Pivetta	Sue Williams	Elizabeth Lewellen
Daylen Schafer	Dorothy Alsen	Kathy Lovell
Ron Spriggs	Don Butterfield	Beth Moyer
Steve Wankowski	Brian Downs	Renee Povey
Herb Sanda	Gareth Floyd	Lupita Rodriquiz
Ron Crusell	Tim Gantt	Debbie Spriggs
Sandy Baren	Vince Huard	Jackie Stahl
Cindy Bienhoff	Don Reid	Barbara Wakefield
Cheri Briggs	Dale Straight	Julie Hawkins
Cindy Cummings	Sandi Arredondo	Karen Densmore
Lisa Fusch	Marie Christman	Terri Grady
Aaron Gagey	Monica Crnich	Rhonda Povey

The Author/Teacher Who Developed This Environmental Learning Experience (ELE)

Tom Files	Highline School	Tom Sawyer
Glendale Jr. High	District #401	Principal

Evaluation Results Regarding This ELE May Be Obtained by Including This Page and a Self Addressed Stamped Envelope To

Highline Public Schools, District 401
Instructional Division
Project ECOLogy ESEA Title III
Bill Guise, Director
15675 Ambaum Boulevard S. W.
Seattle, WA 98166

EVERYTHING IS CONNECTED TO EVERYTHING ELSE

PROJECT ECOLOGY

THERE IS NO SUCH THING AS A FREE LUNCH

PROJECT ECOLOGY TITLE III

EVERYTHING MUST GO SOME WHERE

PROJECT ECOLOGY TITLE III

OBJECTIVES

BEHAVIORAL OUTCOMES IN KNOWLEDGE

As a result of these activities, you should be able to:

Identify at least five different land use categories in an urban environment.

Construct a data collecting and recording tool for some part of an urban environment for data that is observable, collectible, and recordable.

Describe a procedure to use in initiating an urban environmental investigation.

Identify at least three component parts of an urban environment.

Describe four interrelationships that exist between component parts of the environment.

BEHAVIORAL OUTCOMES IN FEELINGS, AWARENESS, VALUES, AND ACTION

As a result of these activities, you should be able to:

Analyze factors and alternative solutions to present condition in an environment.

Identify forces and change agents that can be used for or against the improved livability of the area.

Describe what you can do to become involved in community action programs of identifying and suggesting solutions to local environmental problems.

Describe how you and the community people can become involved in affecting the local political decision-making process through environmental urban investigations.

CONCEPTUAL OVERVIEW

1. Man is influenced by many of the same hereditary and environmental factors that affect other organisms and their populations.
   What is a neighborhood, a district, a boundary?
   What is a neighborhood district boundary?

2. In any environment, one component like space, water, air or food may become a limiting factor.
   What is social environment?
   What is a social environment survey?

3. Natural resources, water and minerals in particular, are unequally distributed with respect to land areas and political boundaries.
   What is county government?
   What is the role of government - the expert, and government - the listener.

4. Increasing human populations, rising levels of living, and the resultant demands for greater industrial and agricultural productivity promote increasing environmental contamination.
   How do we summarize "environmental knowledge"?

5. Environmental management involves the application of knowledge from many different disciplines.
   What happens to the environment of one neighborhood, affects the living conditions and environment of another neighborhood?

6. Zoning is a practice in which land uses are prescribed based upon value judgments regarding the needs of socity.
   Does lack of long range planning cause problems?

7. Increasing population and per capita use of resources have brought changed land to man or resource to population ratios.
   Is there a conflict between the rights to engage in business and have jobs, and the rights of residents to live in a quality environment?

8. Social values and mores influence personal conservation behavior.
   Eminent domain, fair compensation, urban renewal.

9. Individual citizens should be stimulated to become well informed about resource issues, problems, management procedures, and ecological principles.

MATERIALS AND EQUIPMENT
LIST BY LESSON

Lesson 1

Transparencies
Definition of a district
Transportation map of your school's attendance area
Conducting Environmental Survey, Form #1

Lesson 2

Survey preparation handout

Lesson 3

Instructions for the Presentation

Lesson 6

7 or 8 large sheets of cardboard
4 or 5 coffee cans of starch or paste
water
1 big box of crayons or colors
classroom copies of Sea-Tac Communities Plan - Sixth Month Report Map Supplement

Lesson 7

Environmental Assessment
"The Glendale Social Profile"
Map Supplement to Sixth Month Report

Lesson 8

King County Waste Generation

Lesson 10

Law and the City

LESSON 1

TIME: One period or a little less. You might pass out the materials from the "kit" for students to look at if you have time.

CONCEPT: Man is influenced by many of the same hereditary and environmental factors that affect other organisms and their populations.

What is a neighborhood, a district, a boundary?
What is a neighborhood district boundary?

OBJECTIVE: Near the end of lesson, with knowledge of the concepts, groups of five students should be formed according to an agreed-upon neighborhood district boundary that includes their homes or reasonably near their homes.

MATERIALS:
1. Definition of a district - make an overlay of it.
2. A transportation or other purpose map of your school's attendance area. See your school secretary for one. Make an overlay of it.
3. A copy of Conducting Environmental Survey, Form #1

PROCEDURE:

Step One

A. Have this short warmup on blackboard.
   1. What is a neighborhood?
   2. What is a district?
   3. What is a boundary?
   4. Define your neighborhood district boundary.
B. Tell your students this warmup is not a test. It will be referred to again at near end of today's lesson.

Step Two

Make an overlay of definition of a district. Compare student responses from their warm up papers to this definition and conduct a teacher-led discussion into what ingredients are absolutely necessary to understanding neighborhood, district, and boundary.

Step Three

Continue teacher-led discussion into the subject of how the concept of neighborhood district boundary could be applied by each student to his home setting. This step has to be oral so students can complete the ultimate objective of this introductory lesson. Now have each student write a definition of his or her district.

Step Four

From previous oral discussion and from previous associations, students should be ready to form into groups of five (5) students who seem to define their neighborhood districts as being nearly the same. Continue until every member of the class is in some group.

EVALUATION:

Step Five

Have students remain in their groups. Distribute first ditto report form to be completed. From these, teacher should be able to tell which students do not understand concepts and/or are in wrong groups.

NOTE: For those groups having trouble, "What land marks do you feel a part of?"

Step Six

If time, have each group choose a secretary - person to write down all the responses to this question: What activities of our neighborhood might be investigated by someone interested in finding out more about the social environment of the place?

FINAL NOTE: Teachers need to check this first environment report form quite closely:

1. To find groups who overlap into other groups' boundaries.
2. Make the necessary adjustments to reduce overlap and properly assign personnel.
3. Be sure to communicate changes to the students.

D I S T R I C T S

DEFINITION:

A MEDIUM OR LARGE SIZE AREA OF SIMILAR CHARACTER OR TYPE. A PLACE YOU HAVE THE FEELING OF "BEING INSIDE OF". AN AREA THAT YOU CAN MOVE INTO, AROUND, AND THROUGH.

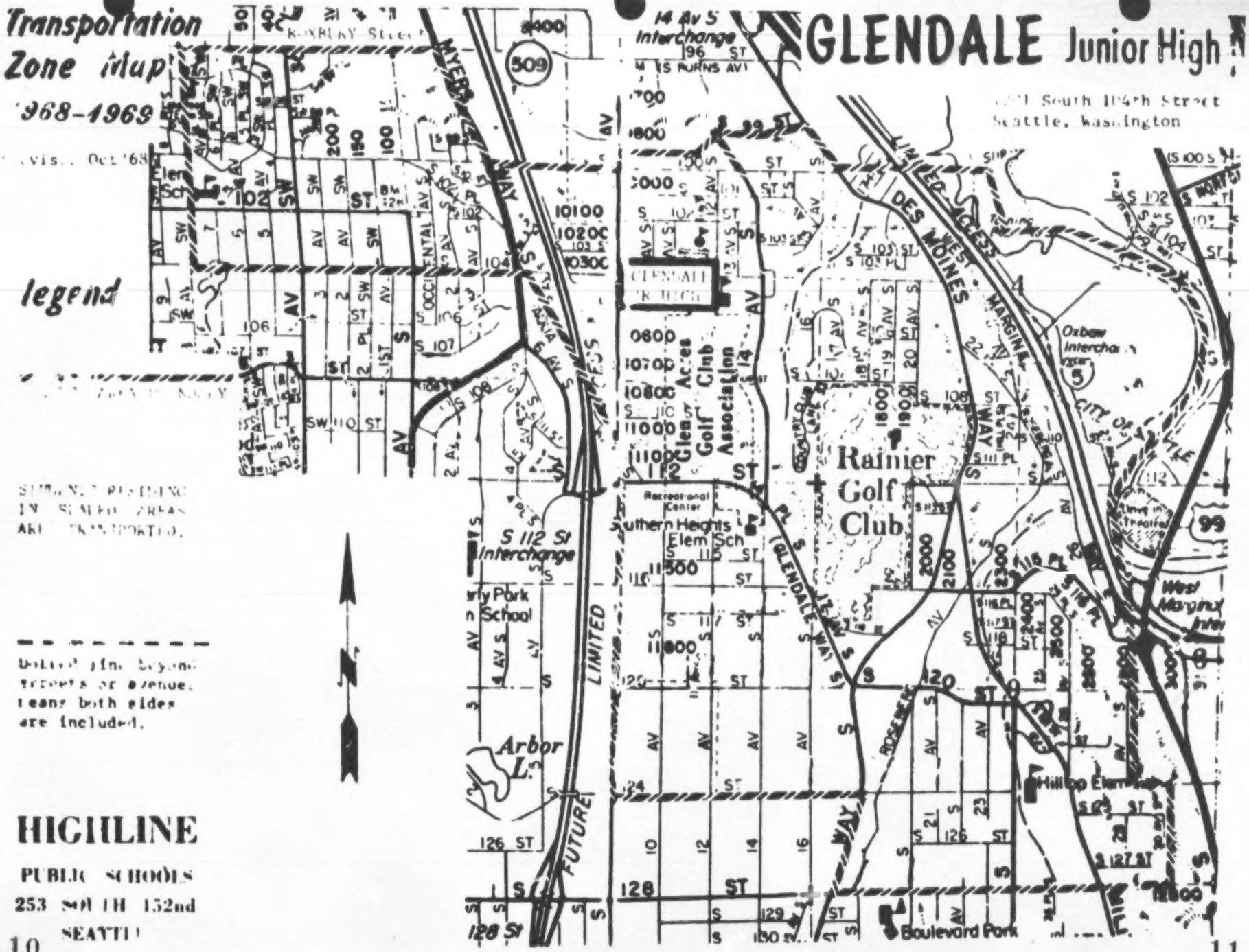
MAPPING SYMBOL:

Transportation Zone Map

1968-1969

...vis... Oct '68

legend



SHADED AREAS INDICATE AREAS NOT SUPPORTED.

Dotted line beyond streets or avenues means both sides are included.

HIGHLINE

PUBLIC SCHOOLS
253 SOUTH 152nd
SEATTLE

NAME _____

Social Studies 9

Due at end of period from each student

Conducting Environmental Survey

Report Form #1

1. Before the lesson - What do you understand by neighborhood district boundary?

2. Names of other members of your survey team.

_____ _____

_____ _____

3. Your survey boundaries are:

4. Why did your group choose the boundaries it did?

5. Think of a most appropriate or commonly recognizable name for most of your surveyed district _____.

LESSON 2

TIME: One day

CONCEPT: In any environment, one component like space, water, air or food may become a limiting factor.

What is a social environment?
What is a social environment survey?

OBJECTIVES: Groups construct and conduct an environment investigation of a defined neighborhood district. Each student construct a data collecting and recording tool for a survey post assigned to that person by the team. Such a tool is observable, collectible, and recordable.

MATERIALS: The survey preparation handout - one for each student.

PROCEDURE:

Step One
Recalling step six of lesson one (1), teacher ask students - *What do you observe about a neighborhood, your neighborhood?* Appoint a couple of students to list student responses on the blackboard.

Step Two
Teacher call on two or three of the sharper students to come to the blackboard. Ask them so whole class can hear - *How would you separate or group these responses into areas to investigate?* Call on other members of the class to suggest labels to call these groups.

Step Three
Call on another two students to come to the board or overhead screen to show how these groups might be reduced in size by abbreviation symbols. This is making a legend for showing this information from a map or similar display.

Step Four
With the student label names for their category groups still on blackboard or hung butcher paper, teacher passes out the sample ditto of suggested labels from an adult source. Have a class discussion on the problem of comparing where forest service labels might mean essentially the same as class ones. The teacher makes clear to class that each group will do the five (5) labels from the U. S. Forest Service, plus the ones from class that have not been incorporated into the "basic 5".

Step Five
Teacher asks students to take out a sheet of paper and make 3 columns named Column, 1, Column 2, and Column 3. Above Column 2, write the title of this chart - 3 Stage Data Collecting Chart, Subject _____
See sample here - Put completed sample on blackboard for class to see.

3 Stage Data Collecting Chart
Subject - Aviation

Column 1 What we want to find out	Column 2 How to collect	Column 3 How to record
Location of flight patterns through our neighborhood into Sea-Tac	Go to spot locations and observe	Maps
Noise levels	Stand with a tape recorder at selected outside and inside locations	Play tape to class with narration
Size of aircraft	Observations	Drawings

Step Six
Students are reassigned to their groups to perform two activities.
1. Group as a whole divide the subjects among themselves.
2. Each student set up his or her chart from the list of assigned subjects still on blackboard.

Step Seven
Each student is to complete the answers to the assigned chart in two nights.

PRIVATE PROPERTY LAND USE SURVEY

I. Inventory and plot on map

List the major uses of land in the area. Stress to students to use their own words for labeling and categorizing this list.

Group these uses into appropriate categories.

Label the categories.

Develop a legend for plotting this data on the map.

2. Additional Information

DEVISE YOUR OWN METHODS TO COLLECT AND RECORD THIS DATA.

SUBMIT THE METHODS AND THE DATA, IN WRITING, TO YOUR GROUP LEADER AT THE END OF THE SESSION.

SOURCE: U. S. Forest Service, Portland, OR
Investigating Your Environment Series, A Lesson Plan for Investigating an Urban Community, page 12

TRAFFIC AND TRANSPORTATION SURVEY

1. Inventory and plot on map

   List the major traffic routes in the area.

   Group these routes into appropriate categories.

   Label the categories.

   Develop a legend for plotting this data on the map.

   Students to add additional names for data to collect, like sidewalks.

2. Additional information

   DEVISE YOUR OWN METHODS TO COLLECT AND RECORD THIS DATA.

   SUBMIT THE METHODS AND THE DATA, IN WRITING, TO YOUR GROUP LEADER AT THE END OF THE SESSION.

SOURCE: U. S. Forest Service, Portland, Oregon
Investigating Your Environment Series
A Lesson Plan for Investigating an Urban Community, page 13

PUBLIC PROPERTY LAND USES SURVEY

1. Inventory and plot on map

   List and name the public property land uses in this area.

   Group these facilities and services into appropriate categories.

   Label the categories.

   Develop a legend for plotting this data on the map.

2. Additional information

   DEVISE YOUR OWN METHODS TO COLLECT AND RECORD THIS DATA.

   SUBMIT THE METHODS AND THE DATA, IN WRITING, TO YOUR GROUP LEADER AT THE END OF THE SESSION.

SOURCE: U. S. Forest Service, Portland, Oregon
Investigating Your Environment Series,
A Lesson Plan for Investigating an
Urban Community, page 14

ENVIRONMENTAL ASSETS AND LIABILITIES SURVEY

1. Inventory and plot on map

List and name the environmental assets of the area. (physical and visual)
Examples: historic landmarks, visual impact structures, natural features, aesthetically pleasing entrances, etc.

List and name the environmental liabilities of the area (physical and visual)
Examples: conflicting land uses, high traffic streets, residential overcrowding, poor paving, curbs, sidewalks, adverse natural features, sameness of environment, etc.

Group the environmental assets and liabilities into appropriate categories.

Label the categories.

Develop a legend for plotting this data on the map.

SOURCE: U. S. Forest Service, Portland, Oregon
Investigating Your Environment Series,
A Lesson Plan for Investigating an
Urban Community, page 15

SURVEY OF THE POPULATION

TEACHERS PLEASE NOTE: This survey could be done by two people.

1. Inventory and plot on map

   Collect information about the population characteristics of the area.
   Age, income, education, size of families, renters-owners, length of residence, etc.
   Students are to be told to tell people in their neighborhood they call on:
   The purpose of this information is to give the students practice in using more exact methods for finding out about local community.

   Develop a legend for plotting this data on the map.

2. Additional information

   DEVISE YOUR OWN METHODS TO COLLECT AND RECORD THIS DATA.

   SUBMIT THE METHODS AND THE DATA, IN WRITING, TO YOUR GROUP LEADER AT THE END OF THE SESSION.

SOURCE: U. S. Forest Service, Portland, Oregon
Investigating Your Environment Series,
A Lesson Plan for Investigating an Urban Community, page 16

LESSON 3

TIME: One or two days

IDEA: Preparing and practicing how you will give the 3-stage data chart to the class by working within the group.

CONCEPT: Natural resources, water and minerals in particular, are unequally distributed with respect to land areas and political boundaries.

What is county government?
What is the role of government - the expert, and government - the listener?

TEACHER PREPARATION: Make enough copies of the following instructions for your students presentation. In preparing class, note that their performance will be evaluated in the following format so organize it as follows.

Step A
Recite your 3-stage data collecting chart to us slowly:

1. Tell what you wanted to find out
2. Demonstrate how you collected.
   Example: If you interviewed people, what did you ask them.
3. Show your recorded evidence - maps, charts

Step B
Compare the methods you used to gather and present information. What was accurate or inaccurate about them?

PROCEDURE: Step One
Distribute to each student sheet entitled "Instructions For the Presentation".

Step Two
Teacher explains it carefully, stopping for questions.

Step Three
Teacher now instructs class members to begin setting up your reports. Write your task down, make your visual displays.

Step Four
Rehearse to a friend. Obtain criticisms and suggestions.

Step Five
Students are to be instructed to make as many copies of their work as there are members of his group.

LESSON 4

TIME: One period, hopefully

CONCEPT: Increasing human populations, rising levels of living, and the resultant demands for greater industrial and agricultural productivity promote increasing environmental contamination.

How do we summarize "environmental knowledge"

OBJECTIVE: Citizens can organize information on their own and present it to planning and decision making bodies. In order for fruitful development of policies to take place, the listeners must react to what they are hearing.

PROCEDURE:

Step One

Teacher assigns every student to play the role of a different governmental hearing officer. The basic five roles are:

1. A representative from the county commissioner's office in charge of private land use planning.
2. A representative from the county commissioner's office in charge of transportation.
3. A representative in charge of public land use.
4. A representative in charge of environmental protection.
5. A representative in charge of population information.

NOTE: There may be more roles to assign depending on how many other labeled subjects are being investigated by the class.

Step Two

After each student is assigned to a specific listening role, and just before students are to give their reports, distribute or call attention to this form for listening:

Subject I was Assigned by
County Office to Listen to

_____

Summary of What Most Speakers Said

What Categories of the Subject were Investigated	How Information Was Collected	How it was Recorded

Step Three

At the end of the reports and before you collect the "government experts" summaries, ask the students to play the role a bit further and to imagine how the experts might have gone about the same tasks differently.

LESSON 5

TIME: One day

CONCEPT: Environmental management involves the application of knowledge from many different disciplines.

What happens to the environment of one neighborhood, affects the living conditions and environment of another neighborhood?

SETTING: Students are to return to their neighborhood survey groups.

PROCEDURE:

Step One
Students are given this chart and asked to complete it as seatwork.

Step Two
Students are now to return to their individual seats and rows. Silently they are to list as many conclusions as they can about the whole community from the summary information on their charts. Collect and grade.

Step Three
Tell students to keep their summary charts. They will be needing them during the simulated public hearing coming up soon.

SAMPLE:

From Mr. Files 9th Grade Classes
at Glendale Junior High, Highline School District

Names of groups areas	White Center	Beverly Park	Glendale	Southern Heights
Private Land				
Purposes	Residential			
Needs	Less apartments			
Problems	Many houses are too old and not kept up.			
Transportation				
Purposes				
Needs				
Problems				
Public Land				
Purposes				
Needs				
Problems				
Environmental Assets and Liabilities				
Purposes				
Needs				
Problems				
Facts About the Population				
Purposes				
Needs				
Problems				

LESSON 6

REVIEW: It is important for the students to see that anyone can gather data; however, it is important to talk to people in the role of experts about one's data gathering process, as in Lesson 4, and see summaries of all associated neighborhoods, as in Lesson 5.

CONCEPT: Zoning is a practice in which land uses are prescribed based upon value judgments regarding the needs of society.

Does lack of long range planning cause problems?

MAIN ACTIVITY OF THIS LESSON:

New student committees are formed on the basis of one student from each of the old committees for the purpose of making a visual model or replica of all the neighborhoods of the school service area. Back in Lesson 3, students on each committee were required to make copies of their information, and distribute one copy to each of their fellow committee members. That information is now to be used.

MATERIALS:

7 or 8 large sheets of cardboard
4 or 5 coffee cans of starch or paste
water
1 big box of crayons or colors
classroom copies of Sea-Tac Communities Plan - Sixth Month Report Map Supplement

PROCEDURE:

Step One

Groups should be formed to make topographic model maps of the entire school service area. It is recommended that one person from each district previously studied in this Pak be in each model group.

Step Two

There are many tasks to be assigned within the group. (cutting, mixing, pasting, coloring, etc.) A different person in each group should be made responsible for a different task.

Step Three

To construct this model, each group is to refer to the Sea-Tac Communities Plan: Map Supplement to Six Month Report pages 5-3, 5-4, 5-5, 5-6, 5-7, 5-8, 5-9. Make appropriate markings on your model.

Step Four

When dried, these models can be used as evidence during the simulated public hearing process to follow.

TIME: Expect to spend 3 days

EVALUATION: Positively accept all models by prominently displaying them. Let the students know this in advance.

NOTE TO TEACHER:

Starting with Lesson 7, the students hopefully will be engaged in simulating the real process of site selection without a master land use plan for a given area, and experiencing the problems lack of planning causes.

Pak 2 - Land Use takes up the specific question of citizen involvement in developing a comprehensive master plan for any given local community.

Contact for Pak 2-Land Use

Mr. Willis Guise
Project ECOLogy
Highline School Dist. #401
15675 Ambaum Blvd. S. W.
Seattle, WA 98166

LESSON 7

CONCEPT: Increasing population and per capita use of resources have brought changed land to man or resource to population ratios.

Is there a conflict between the rights to engage in business and have jobs, and the rights of residents to live in a quality environment?

REVIEW AND INTRODUCTION: In Lesson 6, the students began to experience "expert" gathering of data when they referred to the Sea-Tac Communities Plan, Map Supplements in constructing their displays.

MATERIALS:

1. Neighborhoods in Highline Study Area King County Planning Dept. Use either as a handout or distribute books, Environmental Assessment from the kit.
2. Make copies of ditto attached to this lesson entitled "The Glendale Social Profile".
3. Map Supplement to Sixth Month Report. See your kit.
   NOTE: Both materials #1 and #2 above can be adapted to any school service area in the Highline School District.

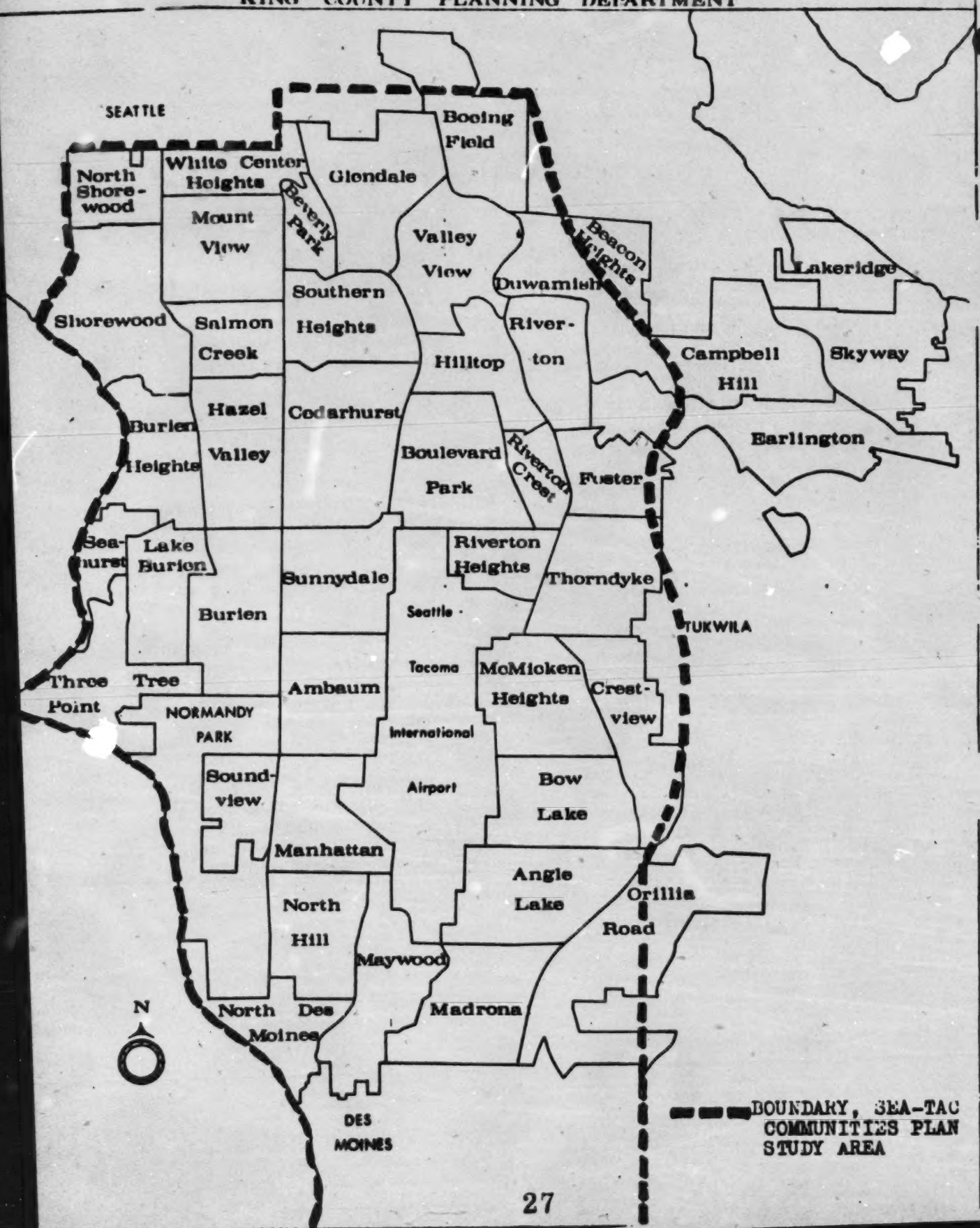
OBJECTIVE: The student is to compare the information he gathers from the map pages and puts on ditto chart with the big visual displays the committees made in Lesson #6.

EVALUATION: The student quietly and in their test-taking seats will turn into the teacher a list of similarities between the information gathered by students as represented by the finished visual displays they have just observed and the information from the completed "social profile" chart in front of them.

ANOTHER EVALUATIVE TOOL: To better assess student ability to understand and interpret social information gathered by planners, have them compose welcoming letters to a student and family moving to his school area from another school area at the opposite end of the school district.

NEIGHBORHOODS IN HIGHLINE STUDY AREA

KING COUNTY PLANNING DEPARTMENT



Social Studies 9
Mr. Files

Full Name _____

Subject: The Glendale Social Profile

Material: Map Supplement, Pages 1-1 to 1-7
Introduction - Page 1-0 - Glendale is part of census tract

/All of 271/ | 274-Upper right hand corner | /265-The East half/ | /268-N. E. ¼/

/All of 269/ | /All of 264/ | /270 East of freeway/

Map #1 Community Trends	Topic Names	Glendale Percentage	Compared to District Norms
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

LESSON 8

TIME: 2 days

CONCEPT: Social values and mores influence personal conservation behavior.

Eminent domain, fair compensation, urban renewal.

PREMISE OF THIS LESSON: Unincorporated King County areas are without master plans regulating the location of private or public projects that affect the school area community's environment.

INTRODUCTION: Starting with this one, the rest of the lessons in this pak are devoted to the students experiencing the application of the information they have collected to a real and quite possible environmental problem.

BASIC ACTIVITY: Each student is to use the resources mentioned in the objectives and materials of this lesson to select three (3) alternative sites from the school's service area for a proposed method of disposing of solid wastes.

PROCEDURE:

Step One

1st day of this 2 day lesson. Motivate students to become familiar with various methods of solid waste disposal you are going to present to them by showing one or both of these short films available from Highline District:

Garbage - 10 min.
Recycling Waste

Step Two

Distribute reading material entitled, King County Waste Generation (RIBCO). Tell students to note that this reading is all about the different "candidates" or choices residents of King County have for disposing with wastes. For each candidate system, show the students there are two or three paragraphs of reading and an accompanying explanatory diagram on the opposite page. This reading should be read aloud by a good reader, but because it is too technical, conduct class discussion on the meaning of each candidate system primarily by having students translate to their own words what the diagrams are trying to say.

Step Three

Teacher assigns students to a different candidate system, and distributes the following specific instructions:

1. Each student will select three (3) possible sites or routes for the construction of his or her assigned candidate system. Each student will select and explain in writing three reasons for his choices and their ranking. Material for doing this is in #5-Natural Determinants section of Sixth Month Report: Map Supplement. NOTE: The land does not have to be vacant. Residents can be paid to relocate.

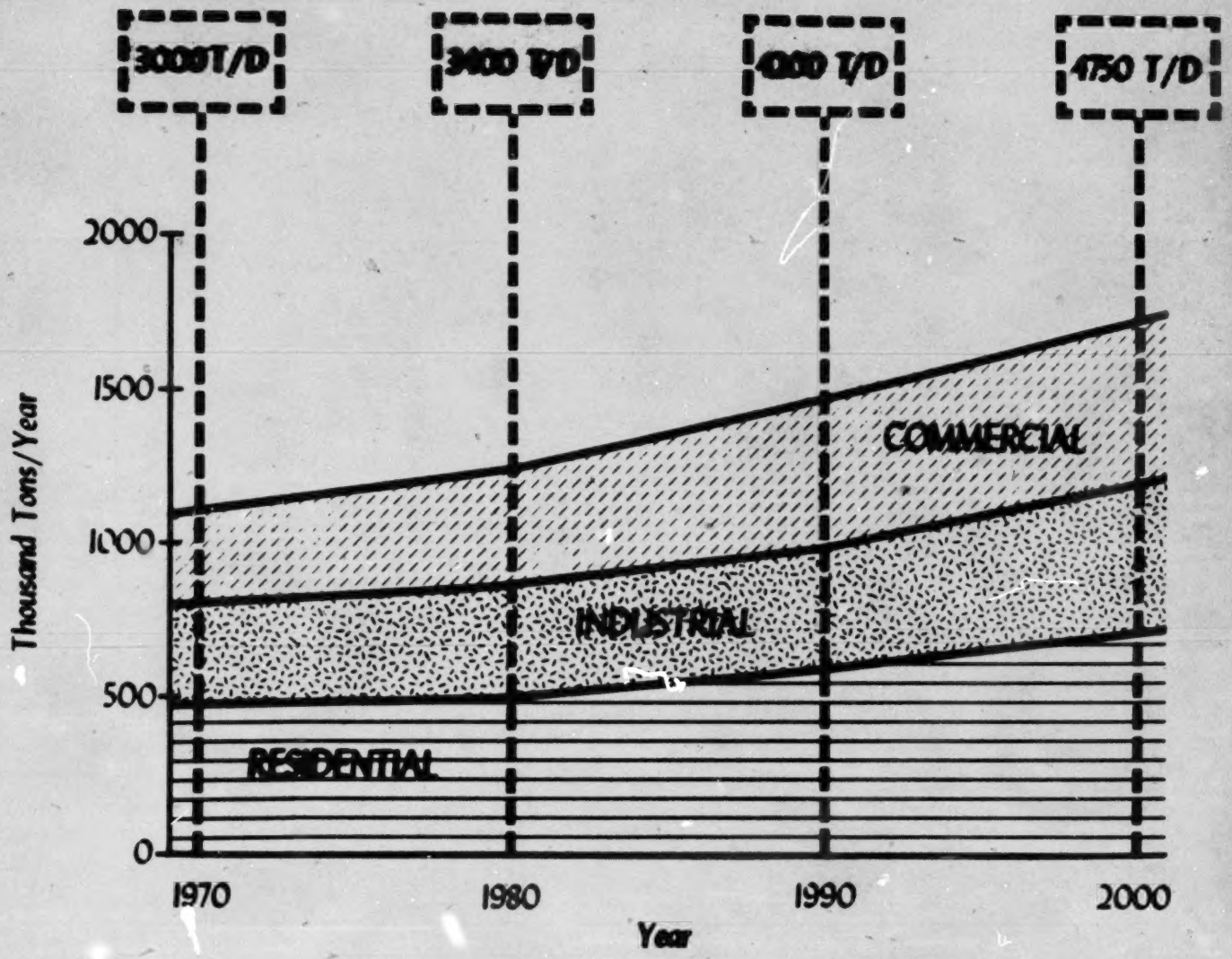
Step Four

Teacher has each student come to front of class and point out his number 1 location choice to class and give his or her reasons. Collect all reports.

Step Five

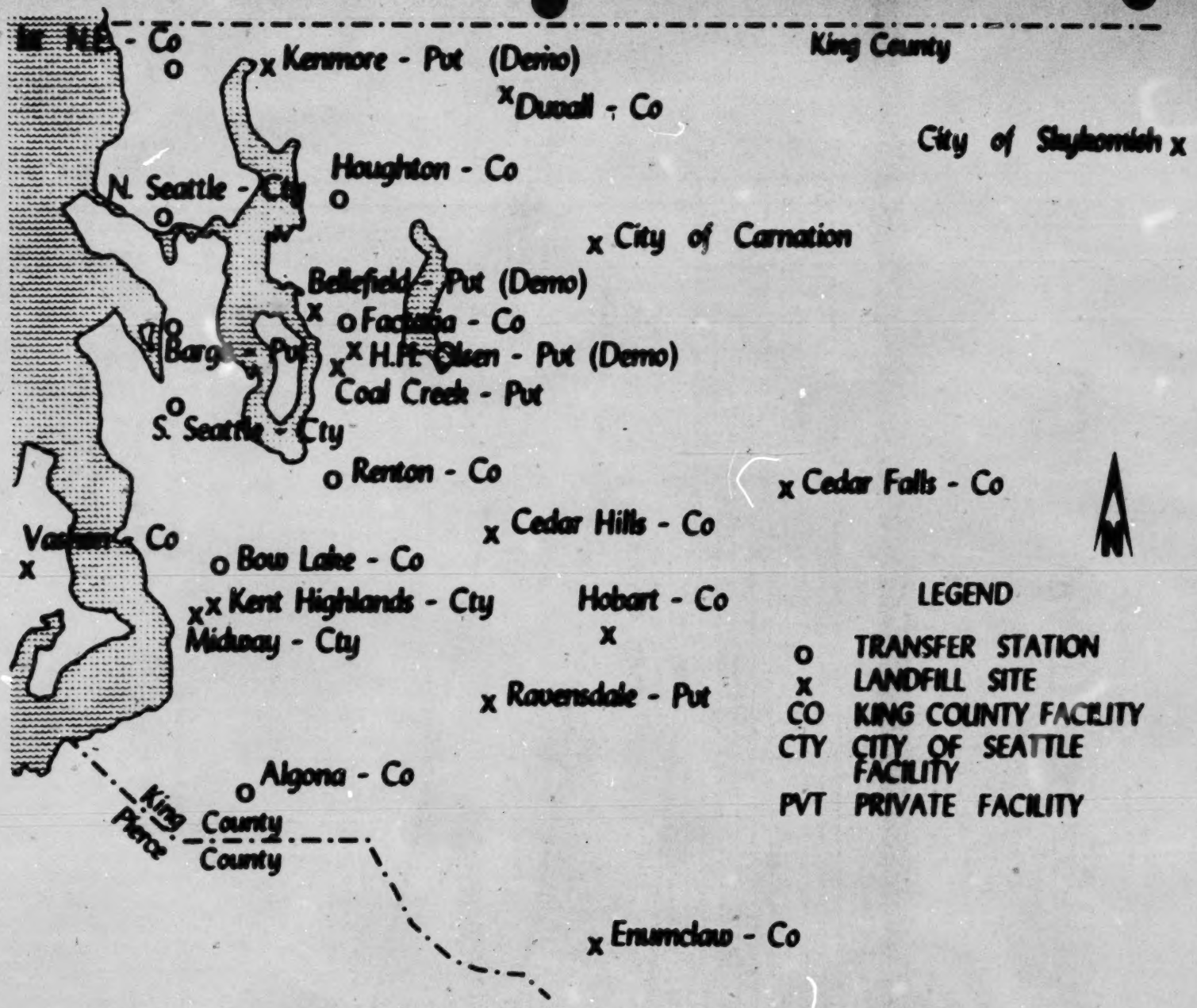
Upon completion of these oral reports, two votes are taken:

1. On the one most preferred candidate solid waste system to be used.
2. On the one most preferred site or route.



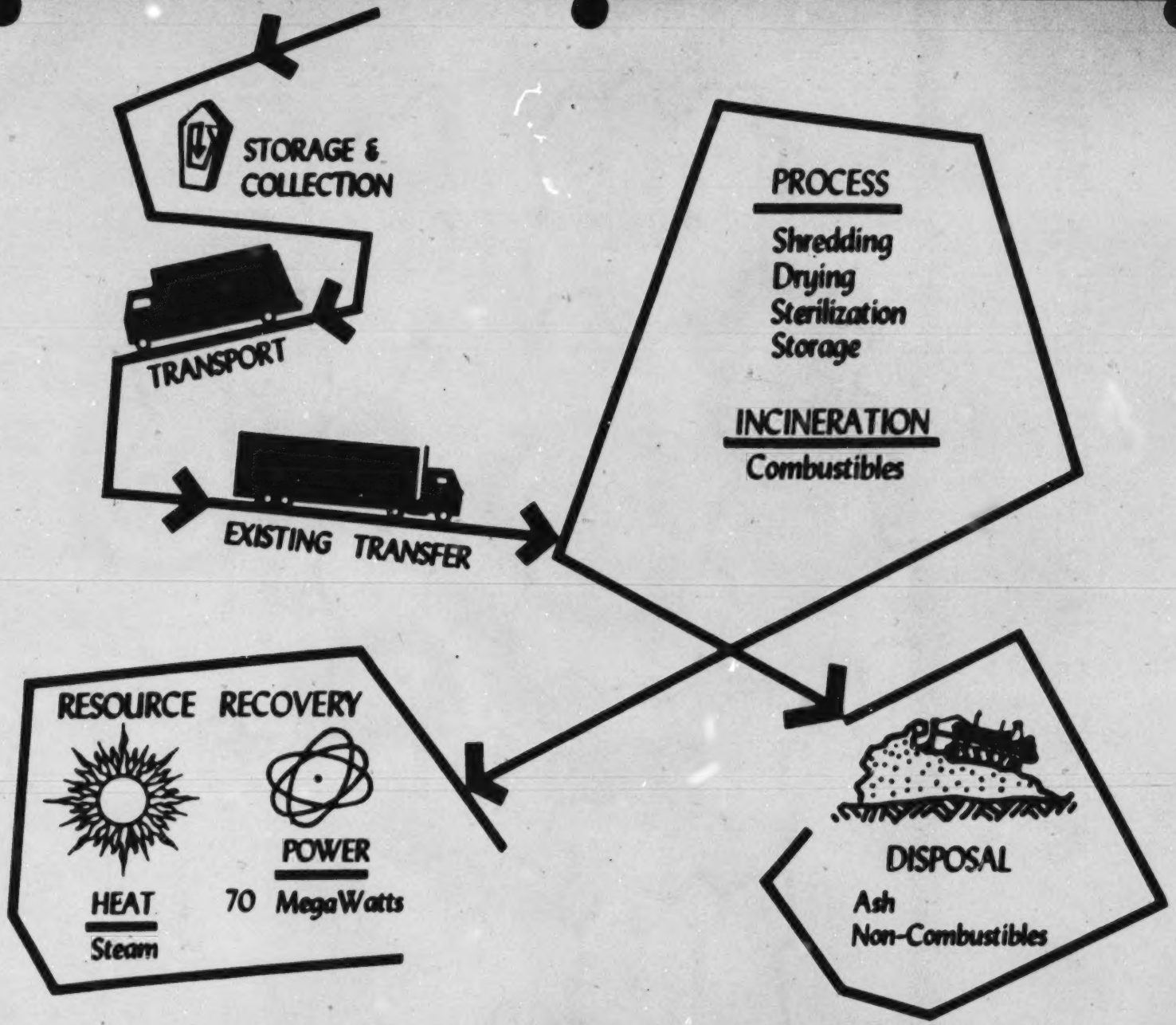
KING COUNTY WASTE GENERATION

SOURCE: Handout, RICBO, Municipality of Metropolitan Seattle, 1973



EXISTING SOLID WASTE HANDLING AND DISPOSAL FACILITIES IN KING COUNTY

KING COUNTY COLLECTION & DISPOSAL COSTS



35

INCINERATION WITH POWER RECOVERY

36

CANDIDATE SOLID WASTE MANAGEMENT SYSTEM

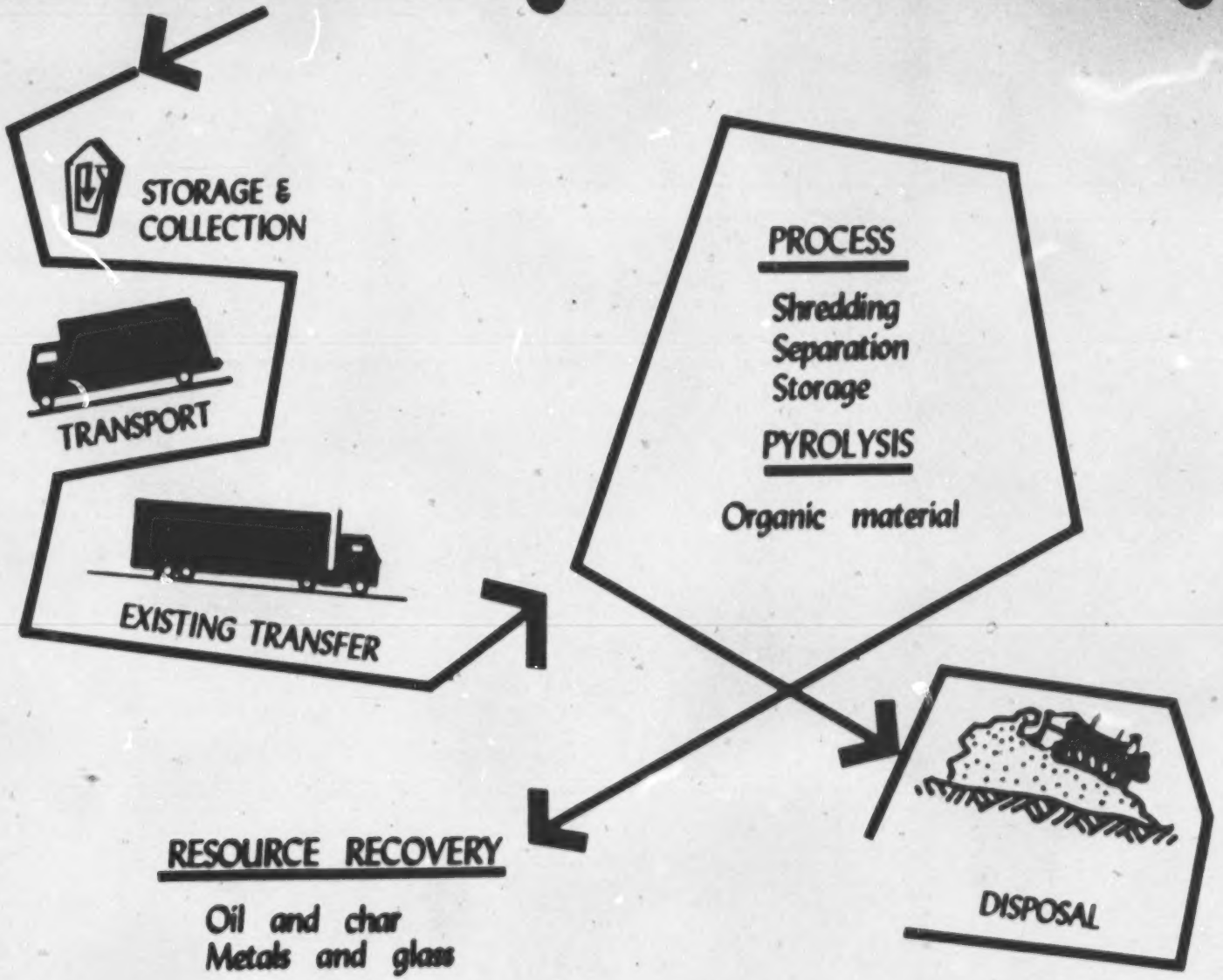
INCINERATION WITH POWER RECOVERY

OVERVIEW

Incineration is the second most popular disposal method in the United States. There are 300 municipal and many thousands of industrial incinerators operating. Only a fourth of the municipal systems meet current air codes. Tight emission control that will be necessary to meet air quality standards set for 1975 will likely hinder the further use of incinerators in large cities. But industrial incinerator systems should continue to be popular--particularly systems in the 200-500 lb/hr range. Volume reductions of 95 percent are common, with reductions of 98 percent possible under some conditions.

Incineration with energy recovery, either to heat water for steam, or as burnable gases, becomes economical only in large units. Chicago began operation of a 1,600 ton/day waterwall incinerator in March. Some of the 440,000 lb/hr of steam generated will be used to operate the plant, with the remainder available for sale to surrounding industries. About a dozen large steam-raising incinerators are operating in Europe.

The only other public system operating with energy recovery in North America is a 1,200 ton/day plant in Montreal, which also began operating this spring. The Montreal plant's four boilers generate a total of 100,000 lb/hr of steam. Montreal figures incineration costs about $7/ton now, and only half that once markets are found for all the steam. With the energy crisis upon us, the desirability of power generation makes this alternative more desirable.


STORAGE &
COLLECTION
TRANSPORT
EXISTING TRANSFER
PROCESS
Shredding
Separation
Storage
PYROLYSIS
Organic material
RESOURCE RECOVERY
Oil and char
Metals and glass
DISPOSAL

PYROLYSIS

CANDIDATE SOLID WASTE MANAGEMENT SYSTEM

PYROLYSIS WITH RESOURCE RECOVERY

OVERVIEW

One of the newest resource recovery processes involves the complete reformation of wastes into the lower molecular weight compounds. Pyrolysis is a series of reactions involving heat absorption conducted in the absence of oxygen or in a controlled oxygen environment which allows product composition to be precisely regulated. It is similar to a distillation process and is often referred to as "destructive distillation."

Through regulation of time, temperature (1,000-2,000°F), pressure, and oxygen, a pyrolysis reactor can produce various products:

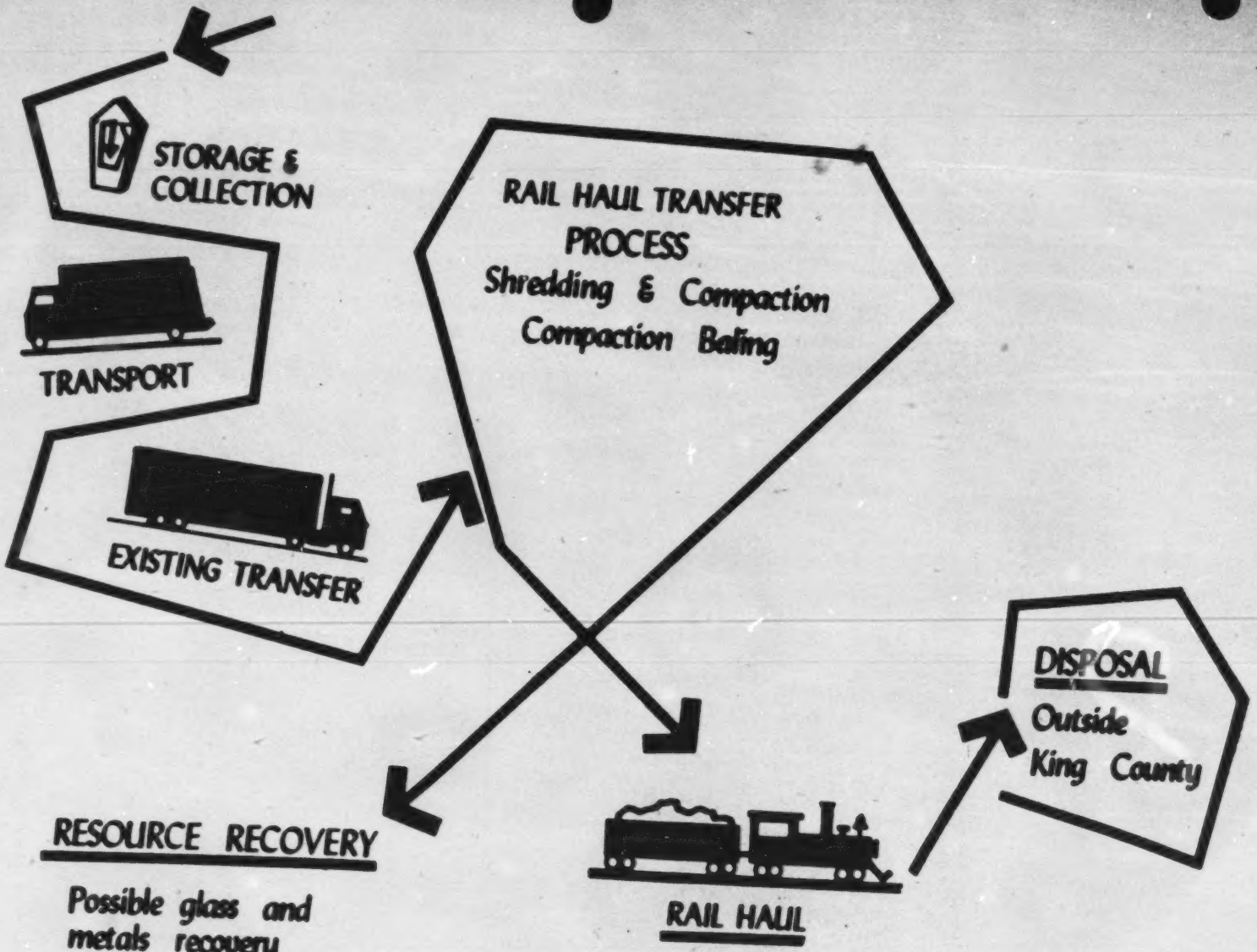
1. a gas consisting of hydrogen, methane, carbon monoxide and carbon dioxide;

2. an oil or "tar" that is liquid at room temperature; and

3. a "char" consisting of almost pure carbon plus inerts (glass, metals).

Of greatest interest in the pyrolysis process is the production of synthetic fuel oil and the recovery of saleable glass and metals from mixed municipal refuse. A basic process would include shredding incoming wastes and separating glass and magnetic metals prior to pyrolyzing the organic fractions and recovery of oil and char generated. Other methods could include waste heat recovery for the generation of steam and internal consumption of fuel oil for complete pyrolysis without supplemental fuel.

Pyrolysis, as a major disposal process of municipal wastes, is still in the pilot plant stage. Studies of pyrolysis systems have been conducted by Garrett Research and Development Company, Monsanto's Enviro-Chem Systems, Battelle Northwest, the University of West Virginia, and Union Carbide. A 150-ton-per-day demonstration plant is now being built in San Diego under an EPA grant by Garrett Research.


STORAGE & COLLECTION
TRANSPORT
EXISTING TRANSFER
RAIL HAUL TRANSFER PROCESS
Shredding & Compaction
Compaction Baling
DISPOSAL
Outside King County
RESOURCE RECOVERY
Possible glass and metals recovery
RAIL HAUL

RAIL HAUL

CANDIDATE SOLID WASTE MANAGEMENT SYSTEM

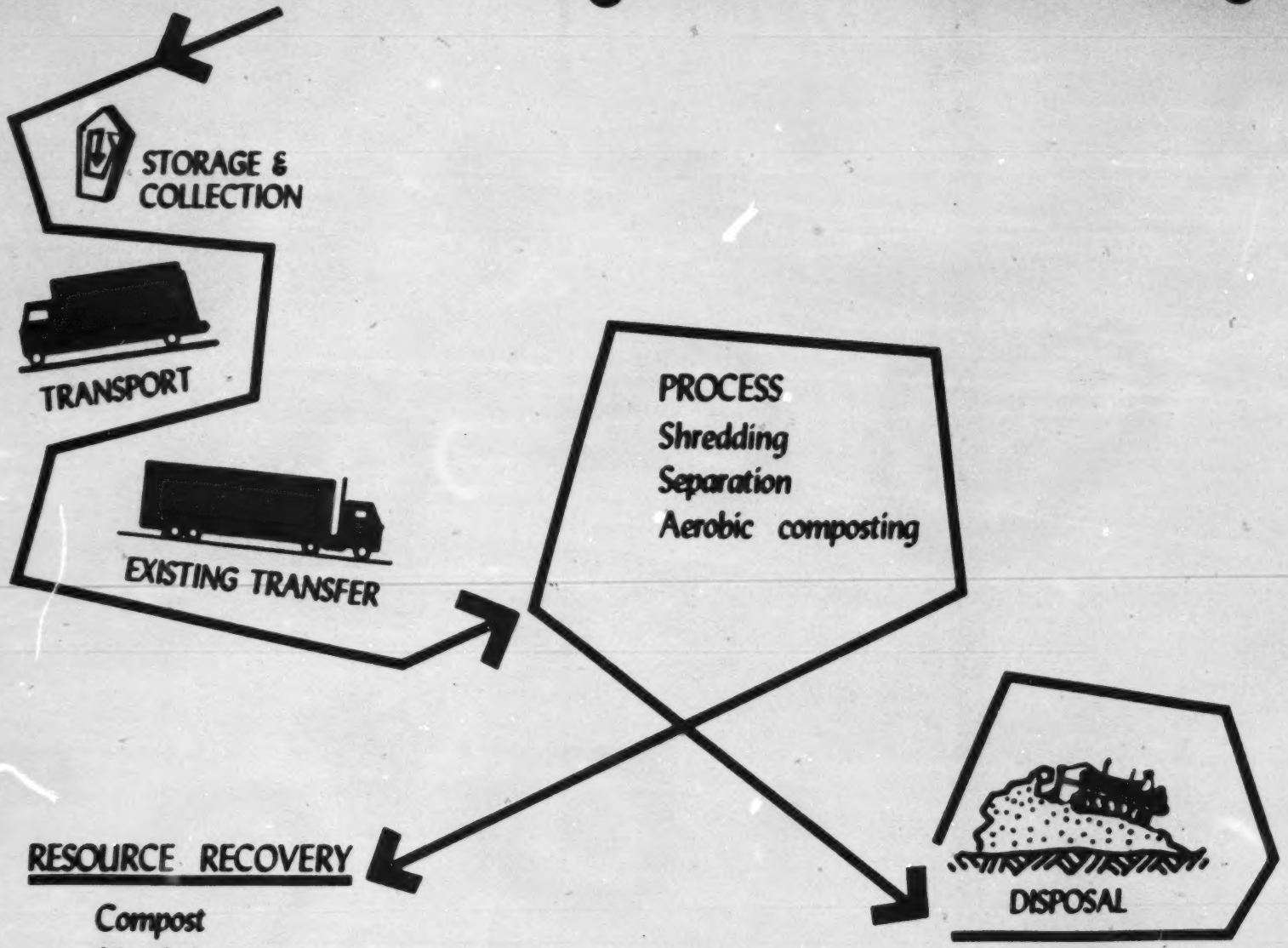
TRANSFER STATIONS WITH RAILHAUL
TRANSFER STATIONS AND STANDBY SANITARY LANDFILL

OVERVIEW

As wastes are transported increasing distances for land disposal, the key factors become processing to reduce bulk prior to transport, and mode of transportation. The problem traditionally has been reduced to two alternatives: transfer and haul of all wastes to sanitary landfills, or incineration to reduce bulk before haul to a land disposal site.

Experience has shown that where suitable sites are available within economic hauling distance, it is less expensive to use the landfill method. The key economic factor is the cost of transport, determined by both distance to the disposal site and the amounts of wastes to be transported.

Generally the lower the unit worth of the shipment, the greater the total weight required to be shipped to obtain economy of operation; as solid wastes have a negative value, the size of the shipment is very important. For that reason, large core cities and their dependent regions are logical input points for solid waste shipment; and railroads offering a high tonnage, long distance, and extensive transportation network, are the logical carriers.


STORAGE &
COLLECTION
TRANSPORT
EXISTING TRANSFER
PROCESS
Shredding
Separation
Aerobic composting
DISPOSAL
RESOURCE RECOVERY
Compost
Metals and glass

COMPOSTING

CANDIDATE SOLID WASTE MANAGEMENT SYSTEM

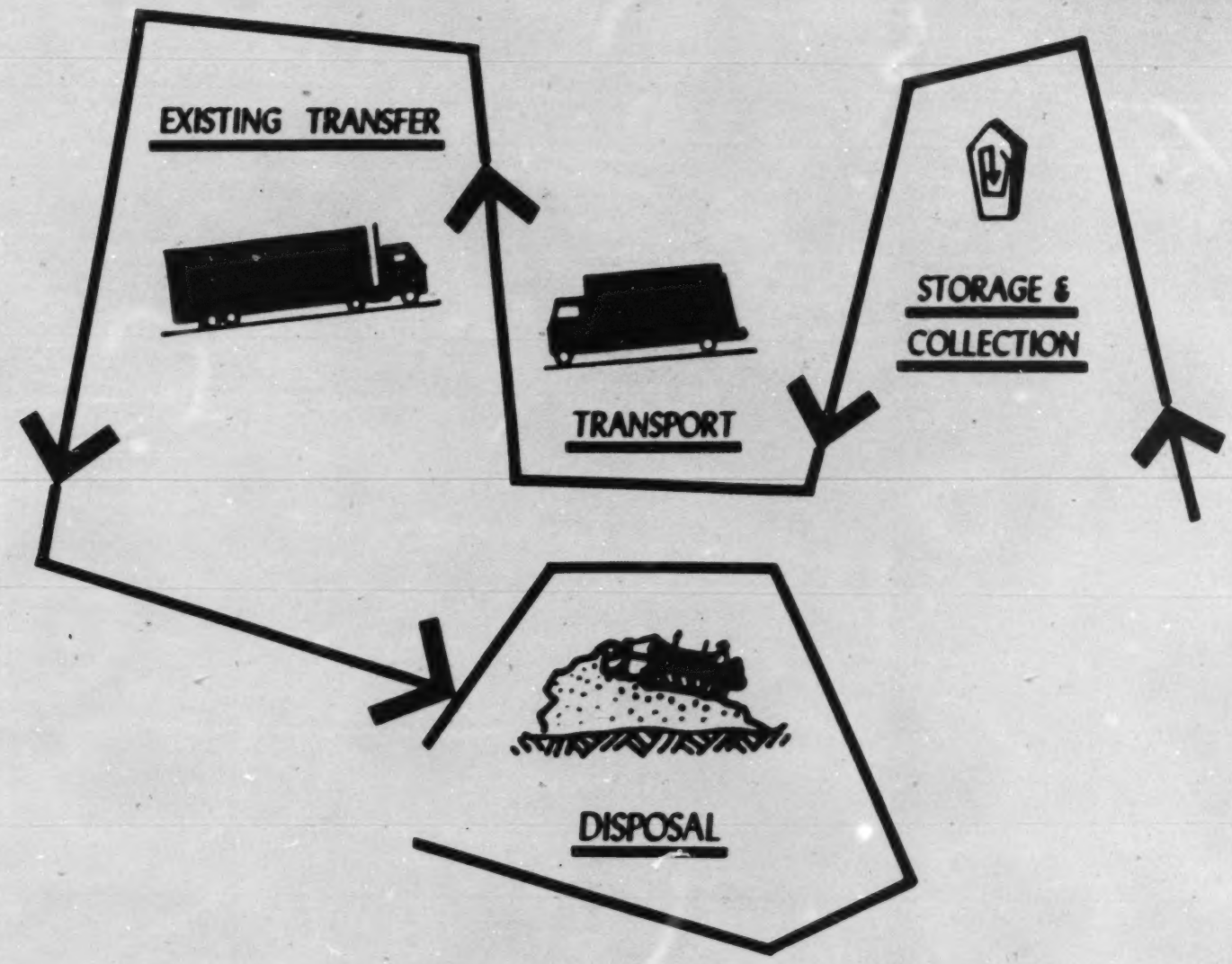
COMPOSTING

OVERVIEW

Composting plants are numerous in Europe and have been established over the past 20 years in the United States. Generally, these have met with little success and all have closed with the exception of two which operate on an intermittent or reduced scale. These include Altoona, Pennsylvania, and Brooklyn, New York. Cities that at one time had compost plants include Houston, Texas, Gainsville and Jacksonville, Florida, and Johnston City, Tennessee. The City of Tacoma also had a fully operational compost plant at one time.

Several processes are available ranging from windrow spreading to sophisticated mechanical digestion. All employ nature's basic decomposition process, but to various degrees control the environment in which natural decomposition occurs. Most employ separation of non-compostable materials from compostable by shredding and rapid digestion through controlled air, temperature, and mixing.

Experience indicates that composting is simply a process prior to ultimate disposal. It lends itself well to a recycle center or as a method of reducing the pollution potential in landfilling. Compost from mixed municipal refuse has not proven to be satisfactory as a soil amendment when compared to manures and chemical fertilizers.



REGIONAL SANITARY LANDFILL

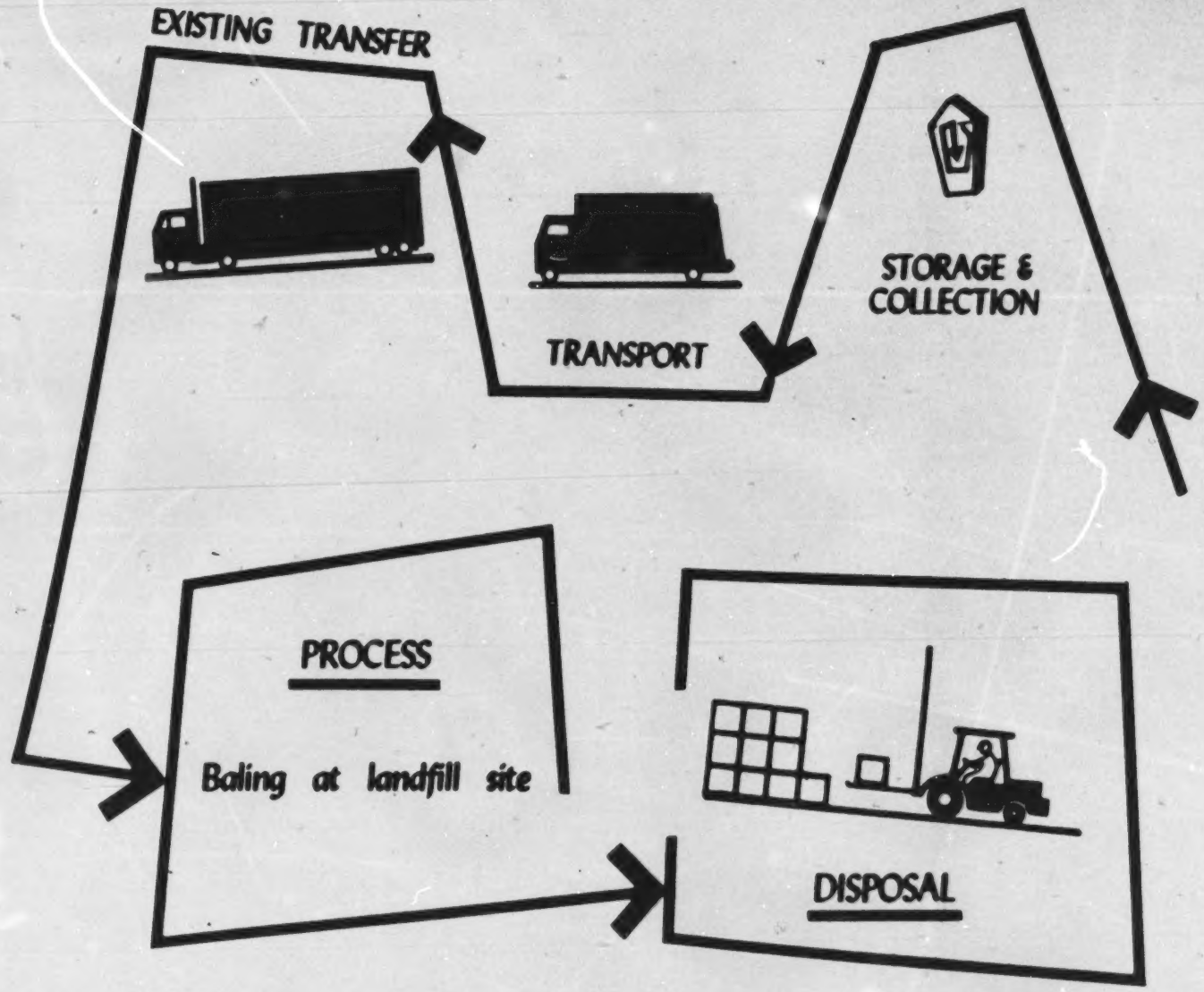
CANDIDATE SOLID WASTE MANAGEMENT SYSTEM

REGIONAL SANITARY LANDFILL

OVERVIEW

The most common system of disposal and the least expensive alternative is the regional sanitary landfill. This alternative is often viewed by the public as having the most local impact and is often misunderstood because many landfills have not been completely equipped to minimize adverse environmental impacts. If well designed and constructed (and afforded the priorities and standards given other public utilities, water supply and sewage disposal) it can function with a minimum of environmental impact and provide a future urban amenity for recreation. This alternative is not just the perpetuation of the existing system, although some existing elements would be incorporated. Design standards will be developed that are commensurate with air, water, and noise requirements applicable to other types of municipal waste disposal systems.

Former landfills near Woodland Park, Ravenna Park, Stan Sayres Pits, and other areas have been converted to open spaces for public usage. These areas might have been developed for other purposes had they not been landfills. This demonstrates the potential for land reclamation or reservation by sanitary landfill.



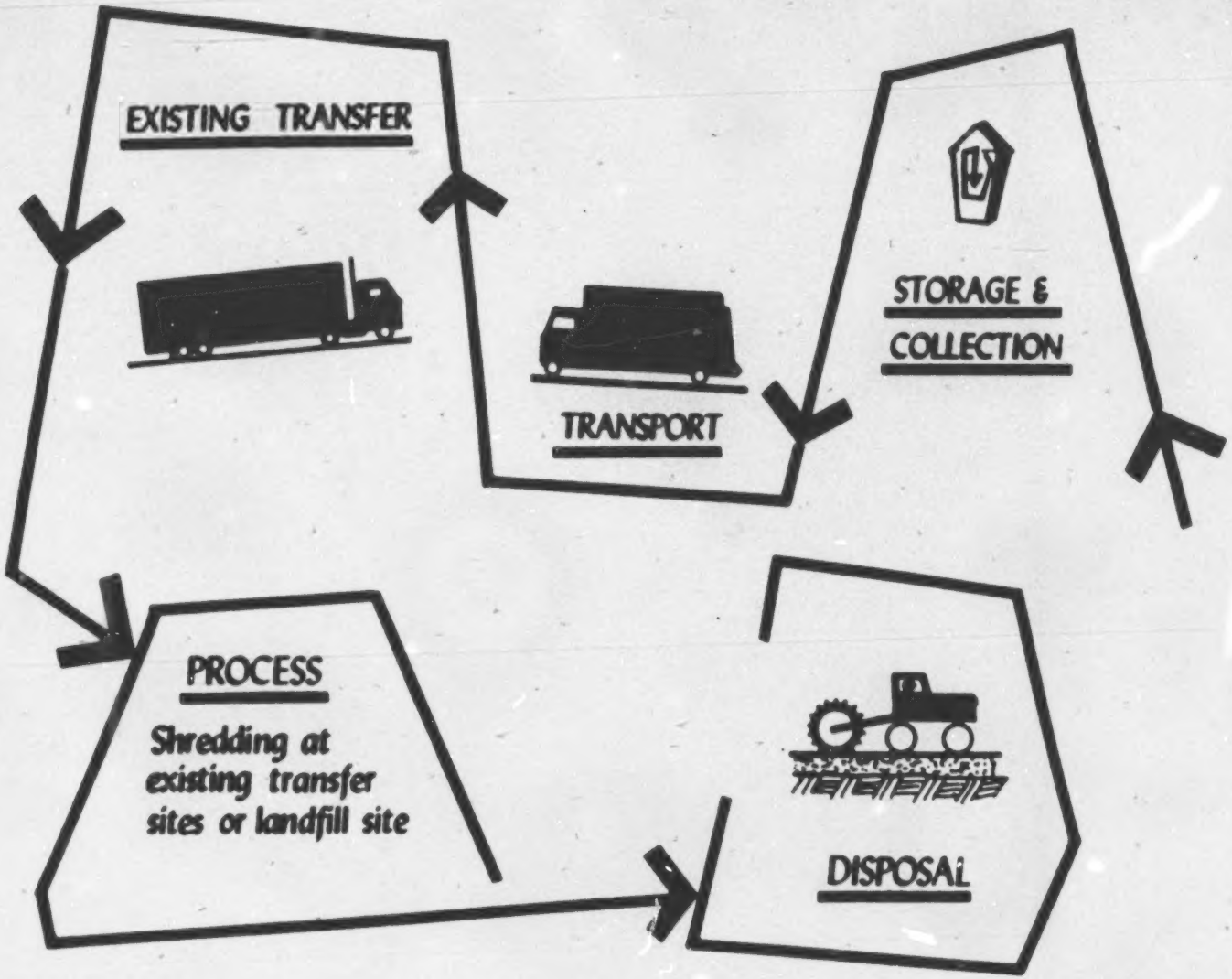
SANITARY LANDFILL WITH BALED WASTE

CANDIDATE SOLID WASTE MANAGEMENT SYSTEM

SANITARY LANDFILL WITH BALED WASTE

OVERVIEW

High pressure baling is a means of improving landfill densities. Experience indicates that pollution potential, as compared to the standard sanitary landfill, is drastically reduced, land is available for more uses, and landfill lives are increased or more land is available for other uses. St. Paul, Minnesota, and San Diego, California, both have examples of baling practices.



SANITARY LANDFILL WITH SHREDDING

CANDIDATE SOLID WASTE MANAGEMENT SYSTEM

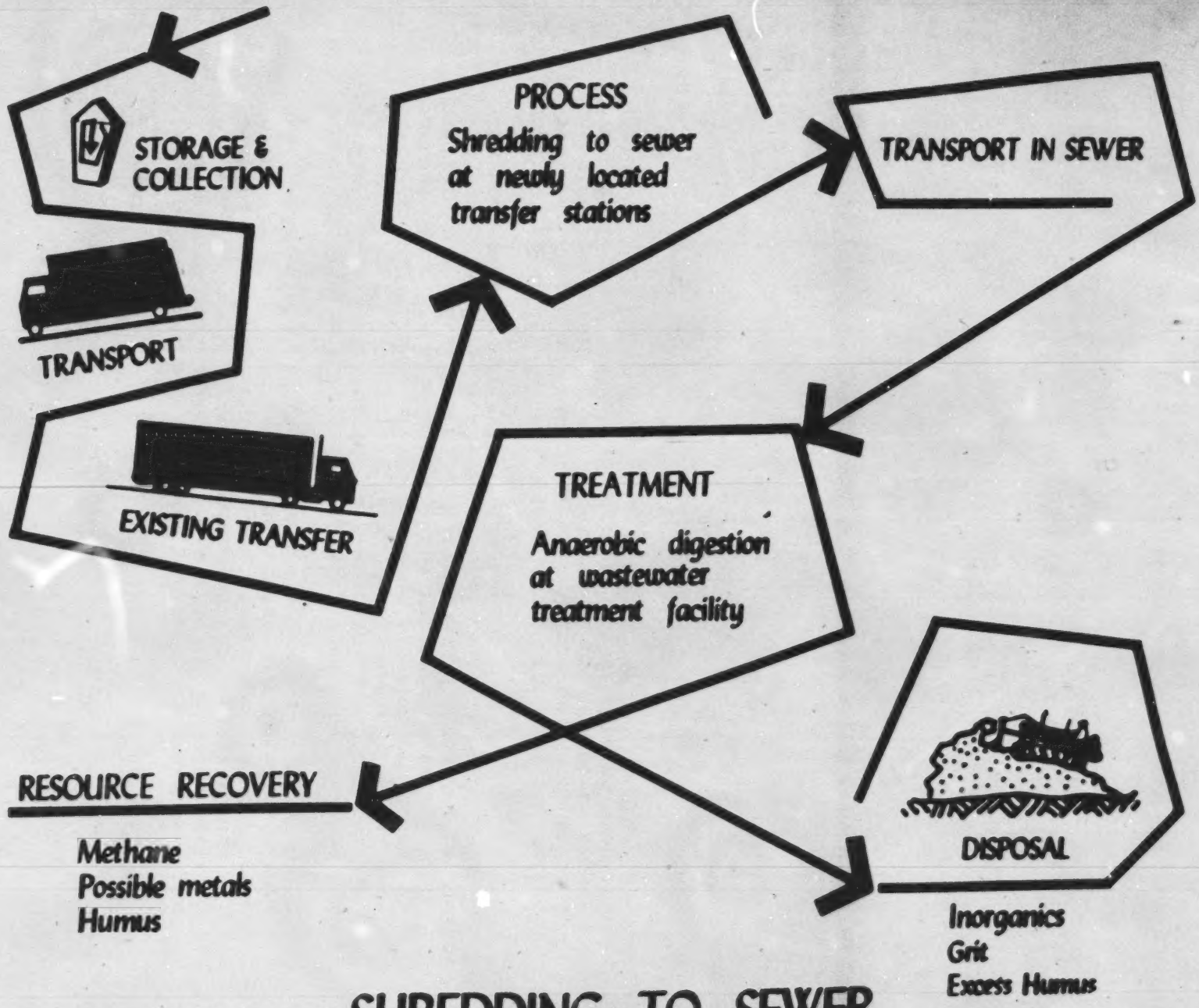
SANITARY LANDFILL WITH SHREDDED WASTES

OVERVIEW

Shredding is a means of changing the form and characteristics of mixed municipal refuse to achieve an improved landfill. In a shredded form, organics decompose at a rapid rate, "burning itself out" quickly. When left uncovered for several years, shredded wastes resemble a humus-type material with only plastics and other nondegradable materials remaining.

Two distinct processes are available, both achieving the same product. The first process is a process in which material is torn or ripped apart. However, bulky wastes, tires, and large pieces of metal, for example, can not be processed without damage to the machine. The second process is similar, but wastes are milled or ground into smaller particles. Some degree of flexibility is allowed as to material input with unacceptable wastes being rejected.

Several installations around the United States exist, Madison, Wisconsin, being one of the first. Vancouver, Washington, is the closest example of municipal refuse processing by shredding and Tacoma, Washington, has one for processing demolition waste.



SHREDDING TO SEWER

CANDIDATE SOLID WASTE MANAGEMENT SYSTEM

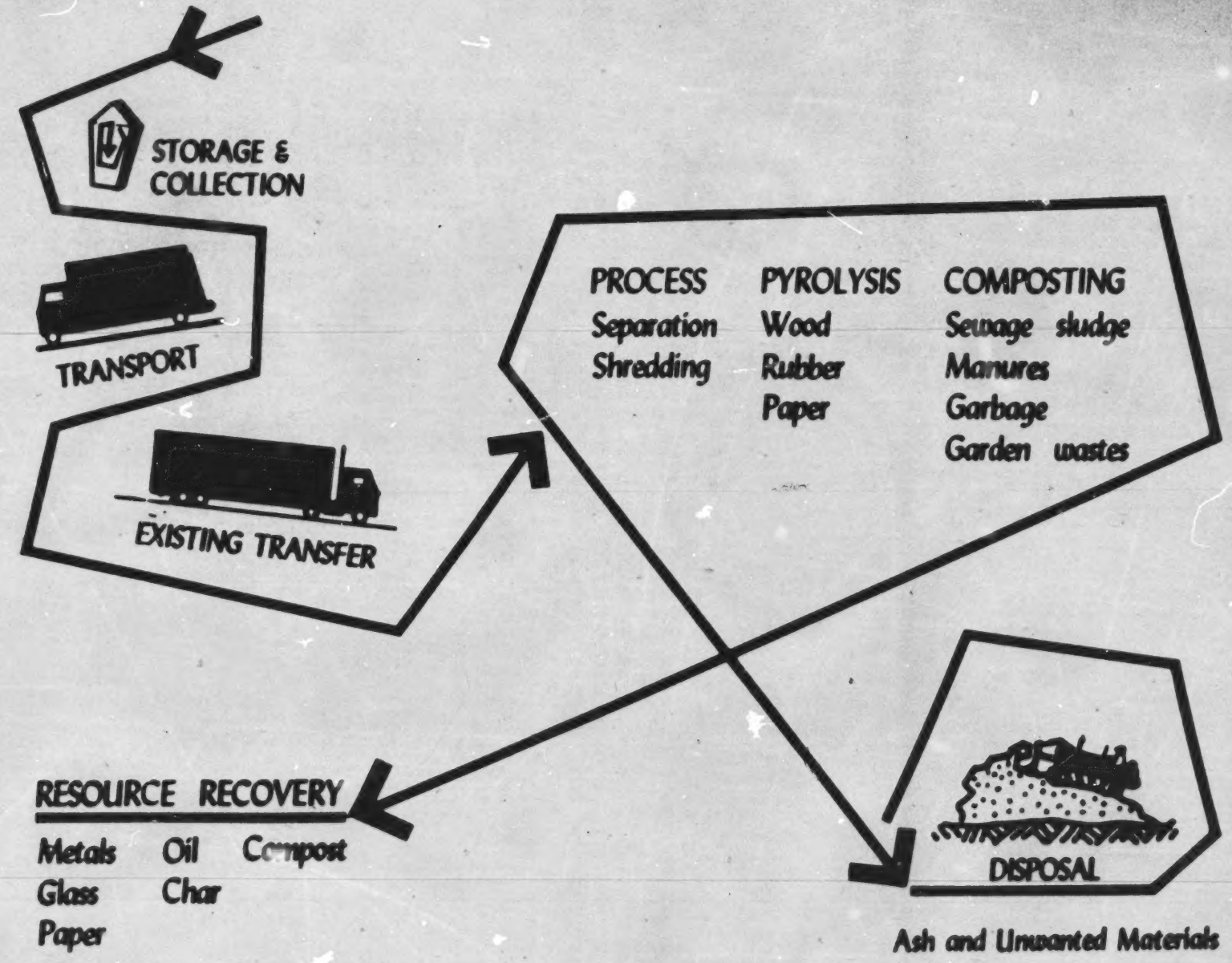
TRANSPORT OF SHREDDED WASTE BY SEWER SYSTEM

OVERVIEW

With current solid waste management systems requiring roughly 80 cents of the disposal dollar for collection and transportation, the idea of using an in-place, low cost transport system like the existing sewer networks is attractive. Material now transported in a sewer is around 99.5 percent water and only 0.5 percent solid matter. Assuming velocities and capacities in the sewer system are sufficient, the solid content in the sewers can easily be increased by grinding organic refuse at either the home, or more practically, at transfer stations strategically located near major sewer trunks and by injecting these wastes into the sewer system.

Although wastewater treatment facilities are not now sized to handle the solids content that would occur from this alternative, technology exists to enlarge these facilities to handle this increased solids loading and to provide rapid anaerobic digestion of these same solids. This alternative has not been applied to date on a large scale; however, the alternative is technically feasible and can best be compared to the use of a home sink garbage disposal on a larger scale.

Backup facilities would be required for materials not suitable for anaerobic digestion or sewer transport, and also for unsewered and outlying areas.



RECYCLE CENTER

CANDIDATE SOLID WASTE MANAGEMENT SYSTEM

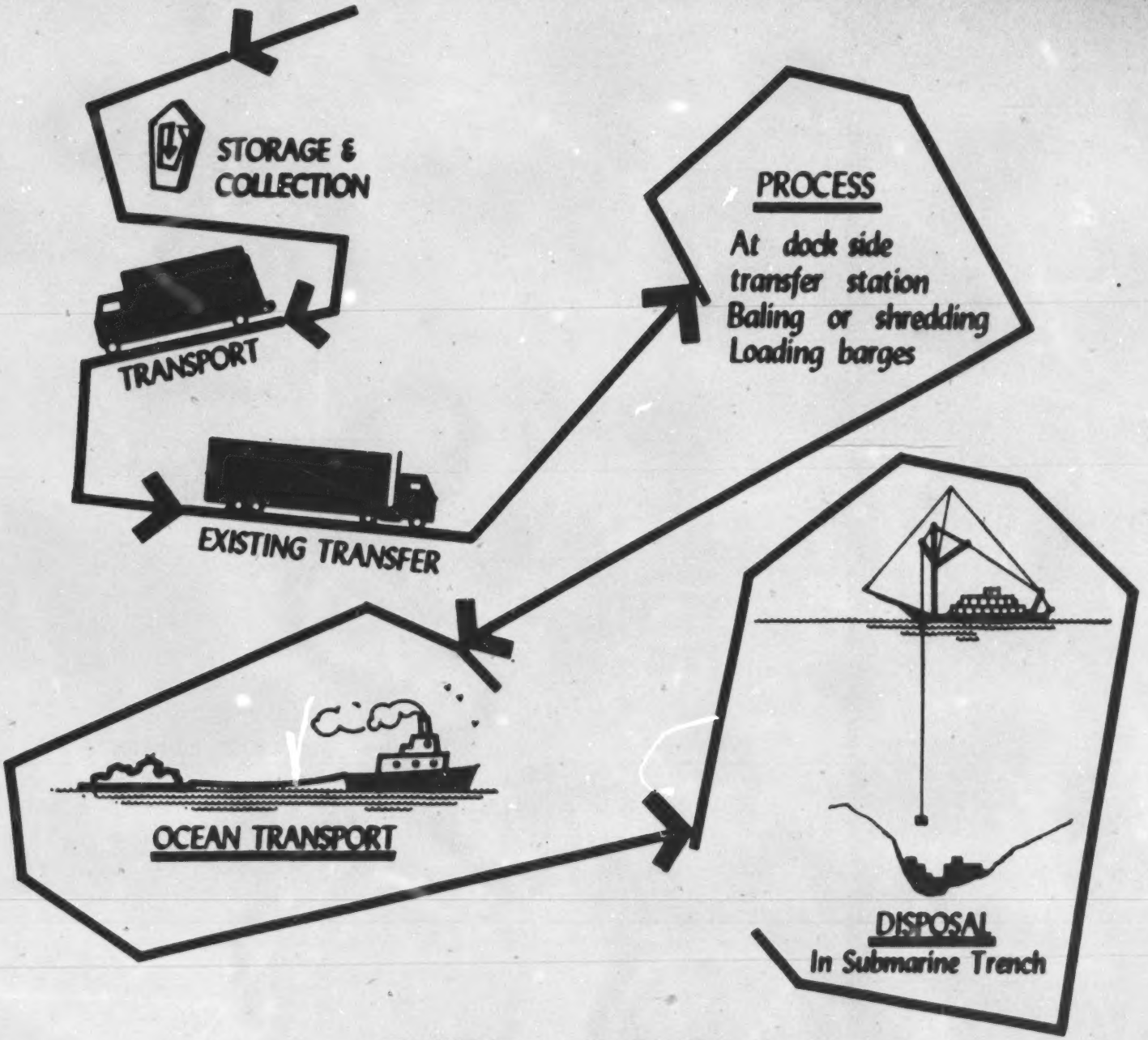
RECYCLE CENTER

OVERVIEW

A recycle center is a facility which contains a variety of processes to transform waste into reusable forms in an effort to minimize the amount of waste actually required to be disposed.

For maximum efficiency of a recycle center, there should be home segregation and products delivered that lend themselves to recycling. Likewise, collection of these materials must concentrate the individual materials to be recycled and bring them to a facility that is cost effective. To reach this position, the center must be able to capture a majority of the available wastes that can be recycled.

The recycle center is only one of a large number of possible combinations of solid waste systems. If recycle centers are found to be desirable for this region the optimum combination with other solid waste systems will be sought. Any recycle system must deal with the fact that there are certain wastes that cannot be recycled and must be disposed of. Only one recycle center of this nature has been seriously proposed, and is under construction in Delaware.



OCEAN DISPOSAL

CANDIDATE SOLID WASTE MANAGEMENT SYSTEM

OCEAN DISPOSAL

OVERVIEW

With competition for land use intensifying, it becomes obvious to seek out other locations for the disposal of refuse. There is little apparent competition for the use of the ocean floor, especially beyond the continental shelf where depths are greater than 600 feet. There are few commercial fisheries at such great depths. Few people could come in contact with the disposed refuse even if they wanted to. The disposal operation would not be an eyesore. It could not be seen or heard by anyone except the operators and a few seagulls. Once the refuse has been disposed of, it appears that it would remain in place indefinitely. Tests have shown that if refuse has been submerged to certain depths, it is hydrostatically compressed and will continue to sink unaided. Refuse disposal in ocean trenches will be drawn into the earth's mantle, never to be seen by humans again.

However, there are drawbacks and uncertainties in the concept. It is very difficult to predict what will happen to the refuse once it has been disposed of. Its impact upon ecology of the ocean floor is not known. And if refuse should be one day recognized as a resource, it will be unavailable.

LESSON 9

TIME: Three periods total

CONCEPT: Individual citizens should be stimulated to become well informed about resource issues, problems, management procedures, and ecological principles.

INTRODUCTORY: Teacher should lecture briefly to students. In our complicated society, members of the same household often have two conflicting roles to play in our society. One role is that of earning money to support the family. This is most often done by going outside of the home and neighborhood. The other important role is often opposite interest of living and relaxing in the neighborhood.

MAIN ACTIVITY: The students will be able to understand this conflict of interest concept in modern society by actually developing interest group roles and acting out a simulated public hearing process.

PROCEDURE:

Step One

Put the students into the following groups by having them draw interest group name slips by lot:

- -The Solid Waste Unlimited Company - developers of solid waste projects
- -The Neighborhood Environmental Improvement Council
- -The Teamsters Union Local located in the nearest town
- -The Sanitary Worker's Union Local in the area
- -The local school board
- -The local builders association
- -The county planning commission
- -The local medical association
- -The County Pollution Control Board
- -A member of the press and radio-TV (two good students)

The last group on this list in the group that conducts the hearing. Call it the King County Council Commission in Charge of Public Works.

Step Two

Preparation before the hearing begins.
Time - rest of this first period
The following material is to be distributed:
"How To Prepare Interest Groups Step-by-Step"

Step Three

Prior to hearing time

1. Teacher distributes "How to Proceed Step-by-Step" to the member of the King County Council Commission who is to act as chairperson. He or she is instructed to read these rules of conducting a hearing carefully with the teacher.

Completing this, the members of the Commission conducting the hearing are advised to prepare an agenda or order of phases of the public hearing. They are:

1. Public Hearing No. 1 - Selection of site or route
   Speakers from interest groups listed here in advance of the hearing.

End of first period.

SECOND TIME PERIOD:

Step Four
The chairperson and the rest of the public works commissioners arrange the classroom according to the attached diagram. Also it is helpful to have the chairperson distribute and read the attached "At the Hearing-Tips".

Step Five
Allow groups 15 minutes time to go over before hearing preparations as well as these new instructions, "At the Hearing-Tips".

Step Six
Just before hearing begins, distribute analyzing information sources form to each student.

Step Seven
Start hearing.

THIRD TIME PERIOD:

Step Eight
After the hearing
Time - The third classroom period
Follow attached instructions and assignments. Be careful to note one assignment is for all groups except one.

PUBLIC HEARINGS

Public hearings give citizen groups still another opportunity to communicate with the public, or publics, for your objectives should be two-fold. First, to get your views before the control agency or legislative body holding the hearing. Second, to get your views to the general public through the press. Here are a few suggestions to help you get maximum benefits from a public hearing.

Before the Hearing

1. Duplicate copies of your prepared statement. Print on only one side of the paper. See teacher for ditto masters.

2. Prepare an advance press release. Again, use only one side of each sheet of paper. Get the release and a copy of your full statement to the press the day before the hearing. Be sure both the release and the statement are marked "Advance Copy - Not for Release Until..." (Insert date and time, a.m. or p.m., when you expect to present the statement).

3. This advance work serves several purposes: it reminds the press that the hearing is coming up; it shows your press contacts that you've thought of them - even though they know you want coverage, and if they cannot cover the hearing themselves, at least they have your statement.

A suggested form for a group's statement to the press and to the commission conducting the hearing.

We recommend (this action about this issue)

because (of these facts)

(and these opinions from our group)

The following steps would be necessary to implement our recommendation.

Signed

Student names _____

_____

_____

Name of interest group _____

Date _____

How to Proceed: Step by Step

1. The Chairman will call the meeting to order and explain the object of of the meeting.

2. He will describe the rules to be followed. These include:

   a. No one may speak unless, after standing, he is recognized by the Chairman.

   b. All remarks must be related to the problem being discussed.

   c. When one person is speaking, no one else may interrupt him.

   d. If the speaker wanders from the point, abuses other people, or in any way defeats the purpose of the meeting, the Chairman will declare him out of order. If the speaker does not correct his behavior, he may be told to stop speaking, or as a last resort, thrown out of the meeting.

3. The Chairman will describe the order of the meeting. This will be:

   a. First, a representative of Solid Waste Unlimited will be asked to stand and describe the company's plan. When he has finished speaking, he may ask experts he has brought as witnesses to stand and speak.

   b. The Chairman will then announce that any person at the meeting who is in favor of the company's plan may stand and have a voice. At that time, he will call on people by the order in which they stand. All people who wish to speak will be recognized.

   c. Next, the Chairman will announce that he will recognize people who wish to oppose the company's plan. Again, he will recognize them in the order in which they stand. All people who wish to speak will be recognized.

   d. After all people on each side have had a chance to speak, the Chairman will announce that the question is open for debate (10-minute maximum). Any person may stand to present his point of view, or to argue against someone else's point of view.

   e. At the end of the debate, the Chairman will thank the people for their participation, tell them that their arguments will be considered by the King County Sewage Commission, and adjourn the meeting.

SOURCE: Adapted from Quigley, Charles, M., and Longaker, Richard P., Voices for Justice Role Playing in Democratic Procedures Ginn and Co., 1970

ANALYZING INFORMATION SOURCES

To be completed by all interest groups during and after the hearing.

Examine sources of information about the simulated issue.

Media (Newspaper, TV, interview report, etc.)	Source of Information (Who put it out) (Agency, Indiv., Org.)	Title	Date	Purpose of Publication or other info.	Points of view Expressed

At the Hearing - Tips

1. Have enough copies of your prepared statement for each member of the committee or board or commission conducting the hearing, plus some extras for their files and have copies for the press too, along with your press release.

2. When you're called to testify, be brief, no more than four or five minutes, but request that your full statement be included in the hearing record.

3. Begin with your name, address, title or group affiliation, and cite other groups, if any, which support your position and have asked you to say so.

4. Tell why you support - or oppose - the subject under consideration. Give facts to back up your position. Don't make charges or accusations you cannot prove.

5. If appropriate, explain how the public interest is affected by the issue, who will benefit and how much it will cost, etc.

6. If you have several speakers, avoid repetition unless special emphasis is desired. Have each cover a different point or approach the problem from a different aspect.

7. Speak clearly -- loudly enough to be heard, slowly enough to be understood, but quickly enough to hold attention.

8. Be prepared to answer questions - to explain your position, to explain the nature of your group, how your group's position was reached (executive board vote, membership meeting, mail referendum, etc.). If you don't know the answer to a question, say so. Don't bluff. Offer to get the answer and send it in for the record. On rare occasions, a committee member may be hostile and may attempt to rattle, confuse, irritate or intimidate you. Don't let yourself get confused, angry or nasty.

9. Try to have many supporters attend the hearing even though they will not testify. Casually mention their presence in the audience in your opening remarks. Some call this "packing a hearing". Others call it "showing strength and support". Numbers reinforce your stand. An indication of broad support can sway legislators as well as public opinion.

10. Listen carefully to other statements presented, especially by the opposition. Make note of factual errors or new ideas or proposals, for you may be asked to comment on what other witnesses say. If so, don't attack the opposition or make personal remarks.

11. Respect the right of others to disagree with you. Do not applaud or show disapproval of any speaker.

12. If you have written statements of community leaders, other organizations, etc. who support your position but could not attend the hearing, ask that the statements be included in the record.

13. Thank the committee or board or commission for giving you the opportunity to testify.

CLASSROOM
FLOOR PLAN FOR KING COUNTY SEWAGE COMMISSION
PUBLIC HEARING

Representative of King County
Sewage Commission, Chairman

Witness
Stand

Witnesses -
Supporters of
the Sewage Plant

Witnesses for
Opposition

SOURCE: Quigley, Charles M., and Longaker, Richard P., Voices for Justice Role Playing in Democratic Procedures, Ginn and Co., 1970

After the Hearing

For all interest groups except public works commission.

1. Promptly prepare and submit answers to any questions you were asked but could not answer at the hearing. If you think any comments made by the opposition were factually incorrect or need rebuttal, prepare and submit a supplementary statement for the record. But don't rehash what was said in your original statement. This instruction is to be done by those members of the interest groups who did not speak.

2. If your press contacts wrote or broadcast stories containing your views, call them, congratulate them on their good reporting and thank them for the coverage.

3. Don't complain to the press if your views weren't included in their coverage, or if you think the coverage was bad, or if you think you were misquoted.

4. One day after the hearing, consider sending a letter to the editor for publication, referring to the hearing and try to point out what, if anything, the public should then do to help.

5. Inform your own members on what happened at the hearing through your organization's newsletter, or a special letter to all members and copies of press clippings, if any.

6. Turn into teacher a copy of all work done here.

To be used only by representatives of the King County Sewage Commission

ESTABLISHING CRITERIA TO EVALUATE RECOMMENDATIONS

To be used by decision making body. After hearing the presentation, rate the recommendations on the chart below.

NOTE: There are many ways to make a decision. Voting is only one of them.

Criteria (List items needed to consider in evaluating presentations)	Recommendations by Interest Groups Name of Interest Group
Like cost	(Rate recommendations against criteria)
appearance	
disruption of other public services	
etc.	
Students playing this role should	
add more with or without teacher's	
help.	

Summary of the Decision-makers evaluation and report:

LESSON 10

RATIONALE: What happens to the people and their property that lie directly in the pathway of an approved development project?

TIME: One period

MATERIALS: Law and the City, Justice in Urban America Series, Boston: Houghton Mifflin Company, 1970, pages 105 to 110

OBJECTIVE: Using the case study style set up in this book, write a fictional law case involving urban renewal. Write the case so that the government's taking of the land under eminent domain does not serve a public purpose.